



Groundwater surface water interaction study using natural isotopes tracer

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Tritium and stable isotopes are a component of the water molecule, they are the most conservative tracer for groundwater study. And also, radon is natural radioactive nuclide and well dissolved in groundwater. Therefore, these isotopes are used natural tracer for the study of surface water and groundwater interaction of water curtain greenhouse area.

The study area used groundwater as a water curtain for warming tool of greenhouse during the winter, and is associated with issues of groundwater shortage while being subject to groundwater-river water interaction. During the winter time, these interactions were studied by using Rn-222, stable isotopes and H-3. These interaction was monitored in multi depth well and linear direction well of groundwater flow. And dam effect was also compared. Samples were collected monthly from October 2013 to April 2014. Radon and tritium were analyzed using Quantulus low background liquid scintillation counter and stable isotopes were analyzed using an IRIS (Isotope Ratio Infrared Spectroscopy ; L2120-i, Picarro). During the winter time, radon concentration was varied from 0.07 Bq/L to 8.9 Bq/L and different interaction was showed between dam. Surface water intrusion was severe at February and restored April when greenhouse warming was ended. The stable isotope results showed different trend with depth and ranged from -9.16 ‰ to -7.24 ‰ for $\delta^{18}\text{O}$ value, while the δD value was ranged from -57.86 ‰ to -50.98 ‰. The groundwater age as dated by H-3 was ranged 0.23 Bq/L – 0.59 Bq/L with an average value of 0.37 Bq/L.